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PACIFIC TELESIS
Group-Washington

March 27, 1997

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Federal Communications Commission
Office of Secretary

EX PARTE

William F. Caton
Acting Secretary
Federal Communications Commission
Mail Stop 1170
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Dear Mr. Caton:

Re: WT Docket No. 96-198, Access by Persons with Disabilities

At the request of the staff, we are submitting the attached report for inclusion in the above-referenced docket.

We are submitting two copies of this notice in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me should you have any questions or require additional information concerning this matter.

Sincerely,

GINA HARRISON/AFC

cc: S. Wiggins

Attachment

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PACIFIC BELL'S ADVISORY GROUP FOR PEOPLE WITH DISABILITIES

PACIFIC BELL'S ADVISORY GROUP FOR PEOPLE WITH DISABILITIES

THE ADVISORY GROUPS' RECOMMENDATIONS AND PACIFIC BELL'S RESPONSE

PACIFIC BELL

A Pacific Telesis Company

June 1994

The 26 recommendations contained in this report represent a year of work by the members of Pacific Bell's Advisory Group for People with Disabilities (AGPD). On behalf of Pacific Bell I'd like to sincerely thank the members of the AGPD for their hard work, insight and patience with us.

The Advisory Group had dialogues with Pacific Bell product managers and officers. The members learned about our product development process and our plans for future products. From the concerns members shared, we learned more about accessibility for people with disabilities.

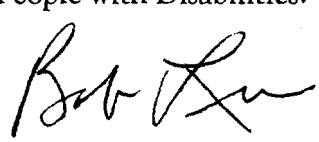
The Advisory Group caused Pacific Bell managers to stretch their thinking. It also helped us acknowledge that we limit ourselves and the company's revenue potential when we do not recognize the needs of people with disabilities. While this report focuses on Pacific Bell, it is our collective hope it will receive much wider attention, and that it will inspire other companies to make their products and services more accessible.

The Advisory Group's message is one that all companies can learn from and use in their own planning. Simply stated it is,

designing in access is more cost efficient than retrofitting products later and will lead to better designed products which can give companies a competitive advantage.

The AGPD is the latest in a line of consumer advisory groups which have assisted us in recognizing the needs of our customers. I hope you find this report as informative as we have.

Thank you for your interest in the work of Pacific Bell's Advisory Group for People with Disabilities.



R. Lee
Executive Vice President
Regional Markets Group

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EXECUTIVE SUMMARY

The twenty-six recommendations adopted by the AGPD fall into one of three categories:

- **Applying Universal Design** — Producing telecommunications products, services, and enhancements that can accommodate the broadest range of users possible, including people with disabilities.

- **Enhancing Products and Services** — Re-examining current offerings in new ways to expand market penetration to people with disabilities.

- **Creating Accessible Future Products** — Designing broadband and PCS so that both these key services are accessible to people with disabilities as soon as they are introduced.

This executive summary provides an overview of these three topics. All recommendations are built on the following assumptions.

Demographic Highlights

- People with disabilities addressed in this report include deaf people and those with hearing loss, blind people and those with low vision, and people with disabilities of speech, mobility, and cognition.

- Forty nine million Americans indicated during the last Census that they experienced one of more functional limitations due to disability.

- A more conservative and relevant estimate indicates there are more than 5.6 million Californians who have functional limitations that somehow compromise their current use of the telephone network.

Market Segment Comparisons

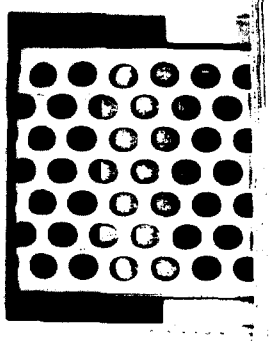
Pacific Bell marketing data for 1993 indicates:

- People with disabilities in California represent more total revenue to Pacific Bell than the home office market segment.

- People who are blind or have vision impairments spend much more on Pacific Bell products than the general market.

- People who are deaf or have mobility disabilities each generate significantly higher usage revenues than the average Pacific Bell customer.

I Applying Universal Design

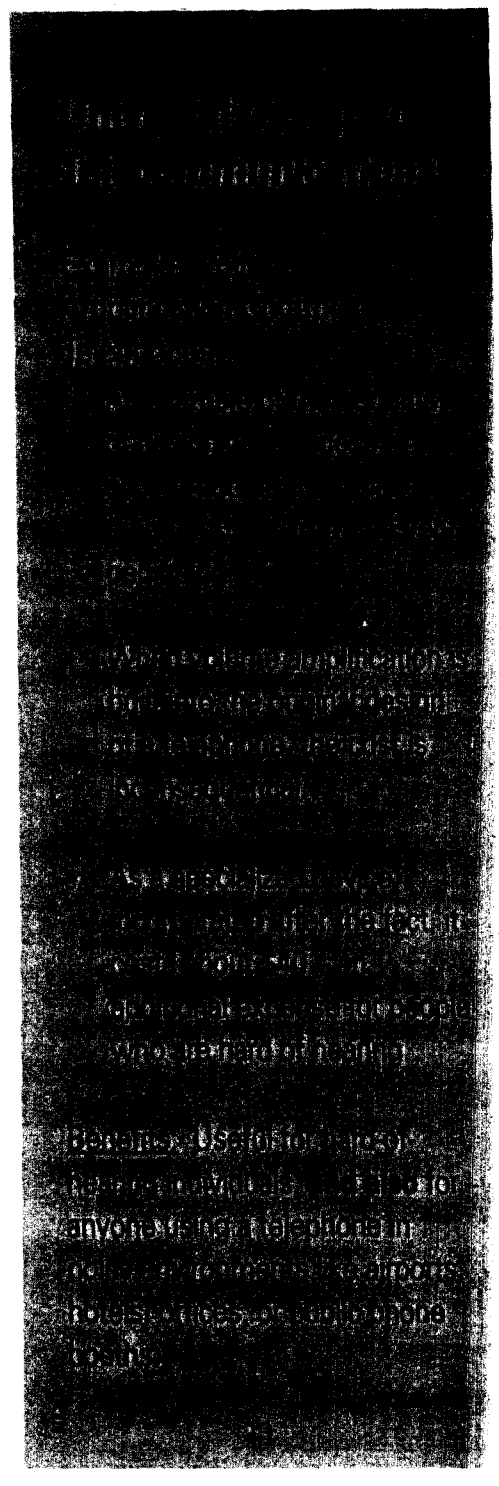


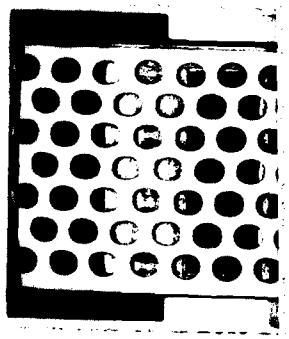
Background

Universal design is a concept used in the process of making architectural environments accessible to people with disabilities. It is based on two simple but important lessons:

- It is much more cost effective to design access at the blueprint stage than to add access on later, through retrofits and reconstruction.
- The quality of access is far superior when it is incorporated into the structural design from the beginning.

Our recommendations below encourage Pacific Bell to apply the lessons of accessibility learned within the architectural realm to the design of its own telecommunications technologies and products. (This especially includes product design at Pacific Bell Information Systems, and also Pacific Bell Directory.)





We believe universal design is the best way for Pacific Bell to capture the smartest thinking about innovative uses for its products, and to meet customers' needs more effectively than is possible to expect from the current design process. (See sidebar)

It also is the key for building new market awareness and penetration that translates directly to Pacific's bottom line.

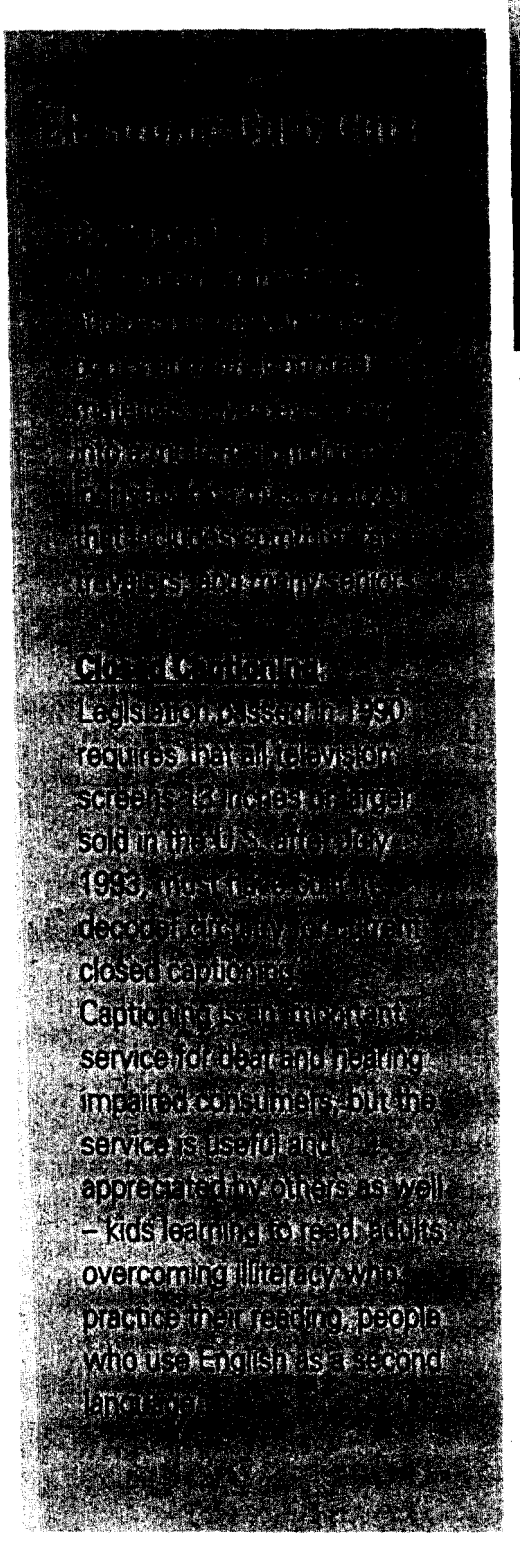
Electronic Curb Cuts

Those of us with disabilities think that universal design in telecommunications will serve the entire society as "electronic curb cuts." Here's what we mean:

- Curb cuts at cross walks designed for people unable to negotiate steps actually assist a wide range of people **besides** people in wheelchairs: parents with strollers, children and messengers on bikes, shoppers with grocery carts.

- Universal design in telecommunications can provide opportunities for people who cannot use the telephone network as it is currently constituted or provisioned, as well as for many others with a wide range of abilities and needs.

- A prime example of a universal design application for telecommunications is the use of redundant visual and auditory information. Many of the recommendations in this report draw on that concept.



Useful precedents for universal design are worth studying. A few other industries besides the building trades have proven that designing a product for a group with disabilities usually turns out to be an opportunity for much broader market penetration with the general public as well. (See sidebar)

Universal Design Means New Product Filters

The early phase of developing, testing, and implementing new products at Pacific Bell is the critical place to begin incorporating concepts of universal design that consider the telecommunications needs of people with disabilities.

The current checkpoints of product development do not include the accessibility requirements of people with disabilities. Products are designed to meet a variety of other user needs, but the assessment has never been extended to include people with disabilities.

Critical questions regarding use of products or services by people with disabilities must be incorporated into the product development process at Pacific Bell if universal design is to be meaningful. It is particularly urgent to include them before introducing new services like broadband and PCS. (See sidebar)

potential customers of a number of broadband services. Designing an interface for them can advance the standard by which all users access telework and other services from Pacific Bell.

To capture those customers, Pacific must address a potential problem right up front. The user interface for broadband videotext applications must be carefully designed. The gateway designed for the broadest number of potential users will bring the greatest opportunities. That means a way must be found now — before the product is off the shelf — to create an interface that can be used by blind and visually impaired customers whose computer "screen readers" would be rendered useless by Graphic User Interface (GUI) applications, a popular current form of interface.

Designing products and applications for broader market uses today can help businesses like Pacific Bell avoid expensive retrofits — and considerably add to their competitive advantage.

Universal Design: New Uses for Broadband

There are 1.5 million Californians with vision impairments who are

Recommendations

(The Pacific Bell Responses are included in Chapter I: Applying Universal Design.)

1) Incorporate universal design into the product development process from the beginning, and throughout the process. (p.27)

2) Require product developers to use the resources and skills of Human Factors Engineering as a critical step in the design and development of all new products. (p.27)

3) Add both staffing and training capabilities to Human Factors in order to provide the necessary expertise to product managers on functional design requirements for people with disabilities. (p.27)

4) Develop practical, workable "filters" in Human Factors that can be applied at all critical phases of product development. (p.27)

5) Require the appropriate leaders of product development to ensure that "filter questions" related to specific functional limitations be analyzed and answered for every new product. (p.28)

6) Include people with disabilities in the beginning and test phases of all new product designs. (p.29)

7) Direct vendors (CPE, network switches) to address specific issues of functional access for customers with disabilities as part of their contractual arrangements with Pacific Bell. (p.30)

II Enhancing Current Accessibility

In reviewing current products and making recommendations, we understand that not every product Pacific Bell offers is applicable for every functional disability; on the other hand, some products are already accessible to certain people with disabilities.

Challenges

Today, when Pacific Bell understands the access needs of people with disabilities, it usually tries to solve them by designing exception processes, or by providing adaptive equipment funded by the Trust (the surcharge on everyone's telephone bills). But the Trust is not designed to address a number of significant barriers to people with disabilities — e.g., Coin Phones, Yellow Pages, White Page Directories, and 411.

Reliance on the Trust or exception processes as the rule of thumb is an ineffective approach — it costs the company in more ways than one. (See sidebar)

Pacific Bell is in a position to make a profound contribution to its marketplace. Opportunities abound with new telecommunications technologies to bring network access to people with disabilities in new and

The Extra Costs of Exception Processing

Example: Manual Service.
Costs: A customer who cannot dial his or her phone requests an operator's assistance to dial, increasing costs that the company is trying to reduce.

Example: Directory Assistance Exception.
Costs: A customer with a vision or mobility disability who repeatedly calls 411 operators free when he needs a phone number is a costly use of company resources.

Example: A visually impaired customer who calls to ask a service rep to read her monthly bill to her over the phone.
Costs: The time it takes the representative to read or repeat items on a phone bill could be spent more productively dealing with new service requests or selling products.

Ultimate costs: Discontented customers and lost market opportunities. People with disabilities resent having to ask for these services. Customers' lack of options means they are dependent on another outside resource. Company resources are not used effectively.

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useful ways. Pacific Bell's challenge is to better understand the issues and make conscious decisions to offer accessibility in its products and services.

Affordability

Barriers to people with disabilities are not only technical; they are also economic. The cost of equipment and services that people with disabilities must bear for day-to-day access to other people or information is often much higher than for the general population. We believe these costs (primarily for customized CPE and computers) will become less onerous only as more responsive and accessible network products and services from Pacific Bell and other telcos become more widely available to people with disabilities.

The AGPD's position on affordability is this: Pacific Bell must strive to develop products that meet the accessibility needs of people with disabilities, but must give all customers different pricing plans from which to select. People with disabilities must not themselves bear the costs required to retrofit current products to make them more accessible.

Pricing equity must also be considered when Pacific Bell offers enhancements to existing products. (Pricing recommendations are explained more fully in Chapter II: Enhancing Current Accessibility)

Recommendations

(Pacific Bell's Responses can be found in Chapter II.)

8) Continue the market focus toward people with disabilities so the business and product teams can understand this segment adds revenue, in addition to helping the company improve its product designs. (p.34)

9) Provide printed materials in a variety of media to better meet customer needs. (p.34)

- ❖ Use audiotext services as a means of disseminating information.
- ❖ Research other formats that would serve the information needs of people with disabilities.
- ❖ Start with the phone bill.

10) Offer Directory Assistance, White Pages, and Yellow Pages in different media, especially Baudot-accessible formats. (p.36)

11) Promote video teleconferencing applications that create greater access for deaf, hard of hearing, and speech-impaired customers. (p.38)

12) Test, develop, and promote ISDN's advanced sound quality to hard-of-hearing people. (p.39)

13) Promote Priority Ringing™ to households with deaf and hearing customers. (p.39)

14) Make the Message Center accessible to TDD users. (p.40)

15) Make products for education accessible to expand the potential market to include special education. (p.41)

16) Increase efforts to inform customers about the equipment lending program. (p.41)

- ❖ Change the name of the program to reflect a functional emphasis. The AGPD prefers the name Pacific Bell Resources for Accessibility (PBRFA).

- ❖ Develop and use a comprehensive mailing list of organizations serving people with disabilities, seniors, and limited English-speaking communities.

17) Include people with disabilities in advertising and marketing campaigns. (p.43)

III Creating Accessible Future Products

Although there are several technologies on the drawing board, it's clear that Pacific Bell is investing heavily in Personal Communications Services (PCS) and broadband. Both these important services must be accessible to people with disabilities—and designed for accessibility from the beginning.

In order for PCS to be truly accessible to all customers, both the equipment and the network will have to be developed including people with disabilities in the design plan. Pacific Bell must use its leverage with equipment manufacturers to make sure PCS products are as accessible as the network.

Access to the new array of broadband services will also be critical. Our meetings with Pacific Bell's broadband planners confirmed that importance. Employment and educational opportunities for people with disabilities will hinge on having full accessibility to many of these services.

There is also a technical issue related to future broadband developments that the AGPD considers critical: the problem of the interface; more specifically, the Graphical User Interface (GUI). It is included below

among our recommendations for making broadband accessible to people with disabilities.

Recommendations

(Pacific Bell's Responses can be found in Chapter III.)

Personal Communications Services

18) Assign top priority to implement Voice Dialing$_{tm}$ for PCS. (p.47)

19) Pacific Bell should set vendor standards for PCS equipment and network services in order to address major concerns for specific categories of disability. (p.48)

20) Include people with disabilities in all PCS trials. (p.48)

21) Develop and market PCS as a "wayfinding" tool to assist users in determining locations, and also as an environmental control device. (p.49)

22) Aggressively market PCS to people with disabilities, demonstrating its advantages both inside and outside the home. (p.49)

Broadband

23) Include people with disabilities in all phases of broadband trials. (p.50)

24) Design redundancy in the use of interfaces for broadband products and services. (p.50)

25) Allow customers to select a mode (text, audio) in which they give and receive information. (p.51)

26) Establish partnerships or alliances with companies that provide (or plan to offer) information in forms accessible to people with disabilities. (p.52)

INTRODUCTION

Challenging Myths — Meeting Opportunities

Our country is currently embarked on a path towards an information society of unparalleled opportunity. Of the many questions that remain to be addressed about the direction and timing of this ambitious journey, one of the most central is: Who will participate?

For citizens with disabilities, it is **the** critical question. Many of the important, hard-fought legislative advances that we have accomplished in the past ten years will be of little consequence if the design of telecommunications systems over the next decade ignores people with disabilities or remains inaccessible to their needs.

This report represents the final recommendations of the Pacific Bell Advisory Group for People with Disabilities (AGPD). We spent the past year questioning, fact-finding, and probing our own assumptions, as well as key managers of Pacific Bell, regarding improved and available access for people with disabilities to the new information infrastructure Pacific Bell is bringing to California.

Although the report calls for several changes in the planning and managing of business activities at Pacific Bell, it does not require sweeping or radical reforms. Our recommendations are built around a business premise we discovered to be at the heart of the company's successful adaptation to the changing realities and needs of customers in the 1990s. **We believe that Pacific Bell can best meet its commitments to people with disabilities by improving what it is already doing when it develops, markets and implements services aimed toward its diverse marketplace.**

In other words, the company must begin modifying its marketing and product development processes to meet the telecommunications needs of another discreet market segment that it can no longer afford to ignore. People with disabilities are an untapped market, eager for accessible network products and services. Paying attention to their needs can bring new opportunities for both the provider and customer alike. The benefits of this approach have been well documented in the company's initiatives to serve the language dependent and home office markets.

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Understanding The Disability Market

The idea of disability is weighted with misconceptions in our society. To many people, disability refers to something that affects only "the unfortunate few." It may not seem unreasonable, therefore, that most marketing decisions today don't reflect the growing numbers of people with disabilities, or associate the unique needs and issues of this segment of the population to a potential source of business revenue. Unknowingly, many companies are missing key opportunities to extend their marketing influence to a significant constituency.

Although disability is not always precisely defined or easily quantified, the updated 1990 Census reveals that:

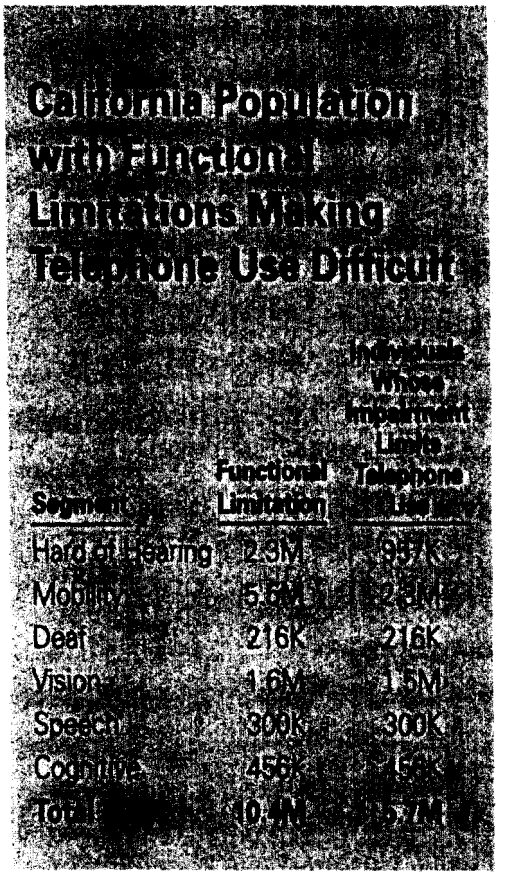
- People with disabilities represent the largest "minority" group in the United States — at its most conservative estimate, **37 million** individuals.
- There are an additional 9 million people with work-related disabilities, making the total **47 million** Americans with disabilities.
- This compares with the following numbers for other segments of the American population:
  - **28 million** African-Americans
  - **26 million** adults over 55
  - **17 million** Spanish speakers in the US.
- Seniors are a major component of people with disabilities. America is graying, and the older that people get, the more likely they are to develop disabilities.
- In addition, the numbers are probably even higher because many people with disabilities are reluctant to identify themselves as such. The negative stigmas associated with being "disabled" are powerful ones.

The Market in California

There are two ways of looking at demographics of disability: the definition of individuals used by the Americans with Disabilities Act of 1990 (such as those with cerebral palsy, epilepsy, HIV infection, learning disabilities, etc.), and functional definitions which quantify numbers of people with specific limitations (e.g., the inability to perform tasks such as reading a newspaper or hearing a conversation over the phone).

Although functional limitation numbers are imprecise, they allow a much larger number of people with disabilities to emerge. Based on rough calculations from data gathered by the National Center for Health Statistics, more than **10 million individuals** in California have one or more functional limitation.

The following table shows the approximate number of Californians with functional limitations representing each of six categories of disabilities that are pertinent to this report. The second column shows what portion of those numbers represents functional limitations that affect **telephone usage** — a more compelling index for telecommunications marketing and product development.



Focusing on the percentage of functional disabilities impacted by telephone usage rather than on aggregate functional data, **5.7 million** people out of 33 million in California have some sort of disability that affects their use of the telephone or network services.

These figures no doubt underestimate the total number of people with disabilities in California, since the environment here is considered "disability-friendly" for many reasons: good weather (important to people with mobility problems); a network of public and private support services; a liberal political landscape; a culture that tends to be less judgmental of differences; and a newer architectural infrastructure adapted for greater accessibility.

What do these numbers mean?

- Functional limitation data can help product developers at Pacific Bell begin making decisions about improving the functionality of products for a wider range of abilities.

- Since people can have more than one functional disability, numbers indicating functional limitations identify the size of the need more precisely for product developers and engineers than other data.

- These statistics can provide a launching place for the company to begin considering the needs of customers with disabilities.

What Do People With Disabilities Want?

We believe that telecommunications is a powerful key that can now turn in one of two directions: to help ameliorate some of the barriers to people with disabilities, or to create higher walls than ever.

Telecommunications services of the future may develop into a seamless mix of voice, graphics, and videotext offerings. As things now stand, this array of new options will be of little use to people who are deaf or have hearing problems, blind or have vision limitations, or those with speech, mobility, and other kinds of disabilities. The much vaunted telecommunications revolution will mean little to people with disabilities if opportunities for jobs, or more inclusive participation in the society, are denied because of barriers designed into the new technologies.

In fact, the revolution may make things worse. What may seem like new and improved high-tech communication to most people may revive old obstacles for people with disabilities. (See sidebar)

But one needn't project to the future to cite problems of access. For decades, people with hearing, speech, and mobility limitations have had to

Technology: Help or Hindrance?

New voice synthesis capabilities built onto modified personal computers have created a radical improvement in communication for blind and visually impaired people. Much of the value of these gains may be lost, however, as on-line, screen-based information services switch from plain text to systems that include graphics (like the popular "Windows" applications). The voice synthesis systems which can "read" text out loud cannot read graphics. Unless alternatives to GUIs are made available, blind people may once again experience old barriers they thought had been removed.

New and emerging telecommunications services and products like voice processing, videotext, and those associated with automatic number identification (A.N.I.) all present potential new barriers as well as the potential to be particularly useful to people with disabilities.

depend on the help of others, get by with very inadequate communication, or simply do without the ability to use the phone.

Today, people with disabilities still lack admission to even the most basic telecommunications services others take for granted:

- Relay services allow deaf, hard of hearing, or people with speech disabilities using a TDD to communicate with the hearing/ speaking public. This service also works in reverse, allowing a hearing person without a TDD to call a TDD user. Though useful as interim strategies, these relay devices should be replaced by new technologies that can provide the privacy and ease-of-use available to everyone else.

- For people with visual limitations, any screen-based telephone display can be so difficult to see it is virtually inaccessible. Information designed to appear on screen must also be designed for access in audible form.

- For people with limitations of reach or dexterity, telephone keypads, keyboards, and controls/switches can be impediments preventing full access to voice and data communication.

- For people with speech disabilities, there is little equipment available that allows them to have private and understandable conversations over the phone.

- For people with disabilities of cognition or memory loss, complicated menus limit the usefulness of audio text, videotext, or computer system software.

- In addition, until recently Number Referral for TDD users wasn't an available option — and for deaf people outside of California, it still isn't.

- Finally, there is the issue of higher costs many people with disabilities have to assume in order to secure equal access to services most others take for granted. The extra equipment and services that people need for basic communication — or the enhanced services required to access information in an alternative manner — usually cost much more than what non-disabled people pay to be connected or on-line.

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Pacific Bell's Commitment

Pacific Bell has lead most other businesses in supporting the rights of people with disabilities. We applaud the company's leadership efforts on Capitol Hill, specifically in regard to the language included in the proposed Brooks-Dingell legislation (HR #3626/ 3636) now nearing final approval

Specific commitments the company championed in this language:

- Assurances by all the Bell companies that telecommunications employee and customer premises equipment, as well as advances in network services, will be accessible and usable by individuals with functional limitations.

- These functional limitations include disabilities of hearing, vision, movement, manipulation, speech, and interpretation of information.

- The only exception to the new guidelines: if the costs of making equipment or services more accessible would result in "undue burden or an adverse competitive impact."

During the last few years, especially since the passage of the Americans with Disabilities Act (1990), the business community has begun to recognize the potential of persons with disabilities as a market segment. The ADA and the Technology-Related Assistance for Individuals Act (1988) both focus on eliminating barriers to full participation by persons with disabilities in American life — not by "curing" the person with a disability, but by curing the problems in the environment (sometimes through legal remedies) which create barriers to participation.

But the ADA does not mandate accessibility in the products people with disabilities must rely upon to improve their environments. That's why the Brooks-Dingell legislation is so critical — and why Pacific Bell's support is such a watershed for people with disabilities. While this agreement from the Bell Companies is a critical first step, improvements must also be secured from the cable industry, information content providers, and other key businesses wanting to participate in the development of the country's new information infrastructure.

People with disabilities are strong supporters of the use of technology because of the dramatic results technology has made in their own lives. We know that without access to modern telecommunications technologies, we cannot participate fully in all aspects of modern life. We also know that supporting new or redesigned technology to accommodate the "fit" between our needs and those of the larger society will create new markets for industries like telecommunications.

The recommendations which follow are specific, workable goals that will improve the fit between telecommunications products and services, and people with disabilities. In adopting them, we believe Pacific Bell will discover new markets to explore, and customers whose lives will offer new insights about the use of its technology.

We intend that these recommendations should also be a wake up call to other companies and industries who must adopt strategies similar to those inaugurated by Pacific Bell if they intend to claim their own lane on the new superhighway.

CHAPTER ONE
APPLYING UNIVERSAL DESIGN

Universal design underscores a principal AGPD goal: producing telecommunications products and services that can accommodate the broadest range of users possible, including people with disabilities.

Just as the ADA has shown us that public buildings must be made accessible to people with disabilities, we believe now is the time to make the telecommunications revolution accessible to people with disabilities.

Any redefinition of Universal Service that includes access to the expanded possibilities of the telecommunications network must take into consideration the functional needs of potential users with disabilities. To ensure that people with disabilities will have a fair playing field, the AGPD maintains that universal design must be a critical part of the new definition of Universal Service now emerging, in addition to existing concepts of penetration and affordability.

What Is Universal Design

Architects have begun to show the way. "Instead of responding only to the minimum demands of laws which require a few special features for disabled people, it is possible to design most manufactured items and building elements to be usable by a broader range of human beings, including children, elderly people, people with disabilities, and people of different sizes." (Encyclopedia of Architecture, Design, Engineering and Construction, 1989, p. 754.)

Universal design might be thought of as "accessible" or "inclusive" design. The underlying goal is to design products or services for the fullest range of human function — taking into account the physical, sensory, cognitive, and language needs or abilities of the broadest spectrum of customers during the initial design phase. To do that, design concepts must be adopted with an understanding of how all individuals function when using a product, service, or physical environment.

We believe universal design is a way for Pacific Bell to capture the smartest thinking about innovative uses for its products, and to meet customers' needs more effectively than is possible to expect from the current design process.

What It Does (And Doesn't) Mean for Pacific Bell

In its recently published Blue Ribbon Report Building the Framework, the World Institute on Disability summarizes what amounts to the best reason for Pacific Bell to begin implementing universal design: "Striving to increase ease of use and convenience for the largest possible range of individuals will expand the potential pool of users, multiply marketability, and decrease expenditures for assistive technology. Profitability is enhanced, and cost is contained."

In other words, it offers the company the best way to harness its technology and product development efforts to reach the unmet needs of an important and large group of customers — a new market niche to carve out along the lines of current competitive strategies.

Universal design is **not** a euphemism for meeting social obligations to the unfortunate few. Universal design does **not** reduce engineering principles to the notion "one size fits all." Certain specialized devices and tailored adaptations to the "built environment" will probably always be needed.

We also recognize that our recommendations for universal design must be flexible, not monolithic. The principle does **not** guarantee functional

Why the Process Needs Changing

- Pacific Bell Message Center — designed, tested, and implemented without considering people who are deaf or hard-of-hearing who use TDDs. As a result, all voice mail instructions to callers today are only *voice* prompts.

An alternative system that makes Baudot tone prompts available to hearing-impaired users who reach the Message Center was never on the drawing board. Deaf customers using TDDs have no way of knowing whether they've reached voice mail, a disconnected number, or a busy signal. In the same way, the system was never tested to determine if Baudot tones could be recorded accurately on a Message Center recording. (Pacific Bell Information Services, to its credit, shared with us the proposal they are considering for a TDD-accessible Message Center.)

accessibility for everyone. Not all telecommunications products or services can be made accessible for every person with a disability, under all circumstances. For example, there are many variables that need to be considered for the functional category "cognitive disabilities." Designing uniform telecommunications access for people in this complex group is difficult, at best.

Nevertheless, we believe that by expanding the definition of what the fullest range of human functioning amounts to — and designing with that new definition in mind — the need for special accommodations will greatly decrease.

Universal design, as a way of approaching the creation and development of new telecommunications products, may seem too abstract a concept outside the building trades. Our recommendations address specific ways to incorporate concrete universal design principles into product development at Pacific Bell.

Universal Design = New Filters

The early phases of developing, testing, and implementing new products at Pacific Bell is the critical place to begin incorporating concepts of universal design that consider the telecommunications needs of people with disabilities. Analysis of the current process demonstrates to us a central problem that can best be summarized in four words: **the filters need improving.**

All ideas generated to address the needs of the telecommunications end user go through filters during the product process. This is a way of "funneling through" hundreds of product ideas and assessing factors such as:

- market potential
- costs versus potential revenue
- strategic fit of the product with existing services
- research required or available
- testing and trial projections ...

... and many other considerations that need to be analyzed. The time constraints on this process are often critical: long enough to accommodate all the important issues, but not so long that crucial competitive momentum gets lost.

The current checkpoints of product development do not include accessibility requirements of people with disabilities. Products are designed to meet a variety of other user needs, but the assessment has never been extended to include people with disabilities. (See sidebar on next page for examples of filter questions)

What Filters Accomplish

The kinds of filter questions we're proposing ultimately go beyond the needs of people with disabilities:

- They indicate ways of developing products that offer alternative adaptations or interfaces to users who may unexpectedly develop difficulties with telecommunications products — the growing population of seniors, for example — many of whom do not want to be identified as "disabled."

- These questions will also help product managers address alternative ways to make network products (like ISDN) less abstract or complex to many potential users.

- Universal design will go far beyond what the present Trust subsidies do to provide access to telephone service for deaf and other people with disabilities in California.

New Filters for Product Developers

A timely meeting took place last August between the AGPD and product developers responsible for Voice Dialing™ (VD). Although VD was then nearing its test-marketing phase, the product managers became convinced it was a good idea to include people with speech, vision and mobility disabilities in the product trial.

The questions we raised were:

- How will VD work for people who stutter?
- What about people with other speech or cognitive disabilities?
- How can the system provide better access for someone who needs to take longer-than-average time to pronounce his or her voice command?

But the larger questions addressed at that meeting point to issues beyond specific user groups. For example:

- What are the parameters around which *any* new Pacific Bell product is designed?
- Will individual customers have control over these parameters?

To cite the case of VD:

- Can I (the customer) adjust the time it takes the system to accept my voice commands?
- Can I program my particular needs into the system as a functional aspect of the telecommunications products I want to use — whether I have a disability or not?

(The Appendix offers more examples of questions for product designers/managers to consider in each category of disability.)